

SAFETY EVALUATION
LACK OF THREE-HOUR FIRE RATED PENETRATION SEALS
IN CABLE SPREADING ROOM CEILING/CONTROL ROOM FLOOR ASSEMBLY
BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated December 8, 1987 (BECO 87-196), the licensee provided information and their evaluation to resolve Item A on page 4 of Region I Inspection Report 87-39 which pertains to an exemption granted from the requirements of Appendix R to 10 CFR 50 to provide automatic suppression in the control room. Approval of the exemption was based, in part, on a 3-hour fire rating for the ceiling/floor assembly between the Cable Spreading Room (CSR) and the Control Room (CR). The December 8, 1987 letter acknowledged that some penetration seals in the CSR ceiling/CR floor assembly do not meet the 3-hour fire rating, and that other seals are so located that the bottom surface cannot be inspected.

2.0 EVALUATION

The licensee presented several technical points supporting their position that the existing penetration seals are satisfactory and that upgrading these seals is not required.

- ° Combustible loading in the CSR is primarily cable insulation, most of which is equivalent to the fire resistance criteria of IEEE Standard 383. Most of the cable, including all of the non-fire-retardant cable, has been coated with a fire-retardant material.
- ° Alternative safe shutdown systems that are independent of both the Control Room and the CSR have been installed. The alternative safe shutdown systems, complete with detailed emergency operating procedures, are available for use in the event of a fire in either or both rooms, and exceed the requirements of Appendix R, both in redundancy and in plant functions provided.
- ° Although the Control Room and the CSR are listed as separate Appendix R fire areas, a major fire in either area would disable the safe shutdown components in the other, regardless of the fire barrier between them.

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- ° The Control Room floor/CSR ceiling is a twelve-inch-thick slab of concrete. Other than some penetration seals and a small amount of uncoated structural steel, the concrete floor is capable of achieving a three-hour rating.
- ° Structural steel under the Control Room floor/CSR ceiling has been covered with a fire-resistant coating at all accessible points; the remaining uncoated steel has been found acceptable in an SER.
- ° Although some of the penetrations are not three-hour rated, they all provide a level of protection commensurate with the barrier's Appendix R requirements. Therefore, the Control Room floor/CSR ceiling provides adequate fire protection to the Control Room and the CSR.
- ° Due to congestion under the CSR ceiling, upgrading the penetration seals would require disruption of many circuits, some of which are safety-related, with extensive impact on time and resources and a potential negative impact on safety.

About 250 holes (typically 6-inch diameter) form the penetrations of interest. All of the openings were initially sealed with a combination of fire retardant foam material, mineral fiber and cementitious grout. This was found acceptable by the staff. The upper surface of all of the penetration seals has been visually examined by the licensee and found to be in satisfactory condition. The bottom surface of approximately 10% of these penetration seals cannot be inspected due to cable congestion. However, the remaining seals have been inspected and determined to be satisfactory.

In addition, the licensee performed a full discharge test of the total flooding Halon suppression system in the CSR following installation. No difficulty was experienced in reaching and maintaining the design concentrations of Halon in the room. This would not have been the case if significant leaks existed in the enclosing barriers, thus, providing indirect evidence that the penetration seals are intact.

The staff agrees with the licensee's position, that considering the combination of conditions that exist in the plant, it is not necessary in the interests of fire protection to upgrade the uninspectable penetration seals in the CSR ceiling/CR floor to 3-hour fire resistance rating.

3.0 CONCLUSION

On the basis of the above Evaluation, we conclude that the existing penetration seals in the Cable Spreading Room Ceiling/Control Room floor assembly are satisfactory and do not need to be upgraded to a full 3-hour fire resistance rating. We also reaffirm the 1981 exemption from the requirements of Appendix R to 10 CFR 50 for automatic suppression in the Control Room even though the exemption was originally granted, in part, on the basis of 3-hour fire rating of the CSR ceiling/CR floor assembly.

Principal Contributor: D. Notley

Mr. Ralph G. Bird
Boston Edison Company

Pilgrim Nuclear Power Station

cc:

Mr. K. P. Roberts, Nuclear Operations
Pilgrim Nuclear Power Station
Boston Edison Company
RFD #1, Rocky Hill Road
Plymouth, Massachusetts 02360

Boston Edison Company
ATTN: Mr. Ralph G. Bird
Senior Vice President - Nuclear
800 Boylston Street
Boston, Massachusetts 02199

Resident Inspector's Office
U. S. Nuclear Regulatory Commission
Post Office Box 867
Plymouth, Massachusetts 02360

Mr. Richard N. Swanson, Manager
Nuclear Engineering Department
Boston Edison Company
25 Braintree Hill Park
Braintree, Massachusetts 02184

Chairman, Board of Selectmen
11 Lincoln Street
Plymouth, Massachusetts 02360

Ms. Elaine D. Robinson
Nuclear Information Manager
Pilgrim Nuclear Power Station
RFD #1, Rocky Hill Road
Plymouth, Massachusetts 02360

Office of the Commissioner
Massachusetts Department of
Environmental Quality Engineering
One Winter Street
Boston, Massachusetts 02108

Office of the Attorney General
1 Ashburton Place
20th Floor
Boston, Massachusetts 02108

Charles V. Berry
Secretary of Public Safety
Executive Office of Public Safety
One Ashburton Place
Boston, Massachusetts 02108

Mr. Robert M. Hallisey, Director
Radiation Control Program
Massachusetts Department of
Public Health
150 Tremont Street, 2nd Floor
Boston, Massachusetts 02111

Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Mr. James D. Keyes
Regulatory Affairs and Programs Group
Leader
Boston Edison Company
25 Braintree Hill Park
Braintree, Massachusetts 02184

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